DOCUMENT RESUME

ED 320 947 TM 015 218

AUTHOR Barton, Paul E.
TITLE From School to Work. Policy Information Report.
INSTITUTION Educational Testing Service, Princeton, NJ. Policy Information Center.
PUB DATE 90
NOTE 34p.
AVAILABLE FROM Educational Testing Service, Publications Order Service, P.O. Box 6736, Princeton, NJ 08541 (item order number 204840, $3.50).
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Education Work Relationship; *High School Graduates; High Schools; Job Placement; Noncollege Bound Students; School Effectiveness; *School Role; *Transitional Programs; *Vocational Education; *Youth Employment

ABSTRACT

Information is provided concerning efforts to improve institutional arrangements for the transition from school to work of high school graduates. Half of all high school graduates move into the workforce, but the attention given this group is almost always in terms of whether they are academically and vocationally equipped before they leave school. The transition into the world of work is usually left to chance. This report focuses on five aspects of the school-to-work transition in the United States: (1) the gradual transition that many high school graduates experience because of part-time work and whether schools and employers can cooperate to facilitate this transition; (2) the fit between classroom skills and workplace skills; (3) the information processing skills high school graduates have and need; (4) efforts to improve the integration of academic and vocational education; and (5) existing people, services, and information that help students in this transition. The information supporting these discussions is derived from a number of sources, including studies conducted by the Educational Testing Service. The nation must deal with non-college-bound students without resorting to a second class educational track that closes off opportunities. Reference notes are provided, and 2 tables and 14 figures summarize the information. (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

RICHARD J. COLEY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED320947

POLICY INFORMATION REPORT

FROM SCHOOL TO WORK

BEST COPY AVAILABLE

POLICY INFORMATION CENTER
Educational Testing Service
Princeton, New Jersey 08540

TM015218

CONTENTS

Preface 2

Acknowledgements 2

Foreword: by Clark Kerr 3

Introduction: Half Our Future 4

A Gradual Transition 7

Classroom Skills and Workplace Skills 11

Information Processing Skills 15

Integrating Academic and Vocational Education 19

Who Links School and Work? 22

In Summary 27

Reference Notes 30

Policy Information Reports **are published by the ETS Policy Information Center, Educational Testing Service, Princeton, NJ 08541-0001; (609) 734-5694.**

Copyright © 1990 by Educational Testing Service. All rights reserved. Educational Testing Service is an Affirmative Action/ Equal Opportunity Employer.

Educational Testing Service, ETS, **and Ⓔ are registered trademarks of Educational Testing Service.**

Preface

From School To Work is about the half of our young people who do not continue their formal educations after they graduate from high school. Proclaimed the "Forgotten Half" by the recent report of the Commission on Work, Family and Citizenship, both their plight and the country's need for their skills are receiving renewed attention.

In this report I have dealt with several important and current aspects of the school to work transition, particularly aspects for which Educational Testing Service has produced information from its educational research efforts. These include the work that students do before they leave school, differences between skills acquired in the classroom and those needed at the workplace, the information processing skills of high school graduates, new efforts to integrate academic and vocational education, and the weakness of linkages between the school and the workplace. The evidence is that the economic position of high school graduates has been deteriorating.

There are hopeful signs that this situation is now getting on the policy agenda, and we hope this report will contribute to the important debates that are emerging. One of the most hopeful ones is the recent statement on National Goals for Education, by President Bush and the nation's governors, which announced the objective that "Every major American business will be involved in strengthening the connection between education and work."

Paul E. Barton
Director
Policy Information Center

Acknowledgements

We are indebted to several officials of the Federal government for supplying information about programs and data collected by the government: Emerson Elliott, Acting Commissioner of the National Center for Education Statistics, Carolyn U. Golding, Deputy Assistant Secretary of Labor, Robert Schaerfl and his colleagues who administer the United States Employment Service, and John Stinson of the U.S. Bureau of Labor Statistics.

Several others were kind enough to provide up-to-date information on the status of programs: Esther Schaeffer, Vice President of the National Alliance of Business, Kenneth Smith, President, Jobs for America's Graduates, and William J. Spring, Vice President, Federal Reserve Bank of Boston.

At Educational Testing Service, the manuscript was reviewed by Richard J. Coley, Margaret E. Goertz, and Irwin S. Kirsch. It was also reviewed by Evelyn Ganzglass, Program Director for Training and Employment, National Governors Association, and Harry Silberman, Professor of Education at University of California, Los Angeles.

Albert E. Benderson edited the manuscript. Richard J. Coley created the graphics. Ric Bruce was the designer, and Carla Meadows did the word processing.

Foreword

All industrial societies create two difficult lifetime transition points — into the workforce for young people and out of the workforce for older people. In earlier agricultural, commercial and craft societies, these transitions were more gradual and more fully cared for within the family and the local community. Now, more persons are on their own in jumping the bigger gaps into and out of the workforce. The more difficult transitions are into the workforce. And the U.S. record in assisting these transitions is among the worst in the entire industrial world.

This is the area that Paul Barton explores out of his vast direct experience and a careful survey of the literature. High school graduates in the United States, who do not go on to higher education, must mostly make their own way. School counselors are overburdened, and helping with job placement is low on their agendas. The U.S. Employment Service has virtually eliminated its school-based programs. Our society spends practically nothing to assist job success among those who do not go directly to college. On the whole, the answer to the question, "Who links school and work?" is, "the young themselves, largely left to their own devices," as Barton points out. "Unlike other developed countries, the United States does very little to smooth the transition from school to work for high school graduates, while it spends large sums on those who continue their educations."

Other industrialized nations have approached the problem differently. Apprenticeship (as in Germany) or the school referral system of students to employers (as in Japan), are two ways, for example, that institutional arrangements can assist and ease the transition from school to labor force. Barton highlights some innovative programs currently underway in the United States while noting that transition services are not enough. High school graduates need to be better prepared in a variety of skills, both academic and interpersonal, that employers consider most important: communication, problem-solving, cooperation, among others.

Barton confronts us with the stark problems, brings together a host of data, and illustrates the range of approaches that might be tried, as well as some promising experiments currently underway. It will take the joint efforts of public policymakers, schools, students, and employers to develop more effective ways to help our nation's youth enter satisfying and productive jobs and careers. One good place to start is a careful reading of *From School to Work*.

Clark Kerr
Berkeley, California
March 1990

HALF OUR FUTURE

A decade ago, an editorial in the *Washington Post* made the seemingly incredible statement that:

In no other industrialized country are the transitions from school to work...left so much to chance as in the United States.

Those familiar with the ways in which this transition is handled in other nations would find it hard to disagree. Such a statement could pass unnoticed, as it largely did, for the same reason the situation exists — our nation has shown limited interest in arranging for the transition of high school graduates into the workplace.

Eight years later, the Commission on Work, Family and Citizenship, in its report, *The Forgotten Half*, put it this way:

Non-college-bound youth who complete high school have been saddled with the thoughtless expectation that they will readily "find their place" and need not be of further concern to the larger society.

While we cease investing in this half of the population when they graduate, we are a nation that is generous with those who continue their educations: The Commission reports that "each student enrolled in an institution of higher education can typically expect to receive a combined public and private subsidy of about $5,000 per academic year — for each of four years or more — through scholarships and grants."

The attention that is given to high school graduates entering the workforce is most always in terms of whether they are academically and vocationally equipped before they leave school and go to work. This is certainly an important consideration since the academic skills of high school graduates remain a neglected matter. However, this way of putting the question itself illuminates the nature of the transition-to-work problem: In the United States, the institutions of school and those of work are separate and most always far apart. There are quite limited institutional arrangements to facilitate this transition.

We even have difficulty talking about how best to help "the non-college bound," as if it is a failure of the family and the school that they are going to work rather than continuing their education. We seem to fear that any special help we might give them may be perceived as tracking them away from college or as limiting their futures in a society that excels in offering a pluralistic system of postsecondary education. This concern about keeping options open as long as possible is, of course, a healthy one. A better system of transition arrangements will need to take into account this American value, and we must avoid labels that classify students in ways that limit their opportunity.

This legitimate concern for keeping options open, however, must not result in paralysis. The position of these high school graduates in the economy is deteriorating. The unemployment rate of the high school class of 1965, in October of that year, was 12 percent. By 1980 it had edged up to 19 percent. In the depths of the deep recession of 1982 it was 26 percent. By 1986 it had dropped to 20 percent and has since settled in at about three times the national

Table 1

Percent Change in Real Mean Annual Earnings of 20-to-24 Year Old Civilian Males (in 1986 dollars) (1973-1986)

	Percent Change			
	Total	**White**	**Black**	**Hispanic**
All Males Dropouts	-26%	-21%	46%	-29%
High School Dropouts	-42%	-42%	-61%	-27%
High School Graduates	**-28%**	**-24%**	**-44%**	**-35%**
Some College	-16%	-11%	-43%	-21%
College Graduates	- 6%	- 6%	+ 7%	N.A.

Source: *The Forgotten Half*, Final Report, the W. T. Grant Foundation Commission on Work, Family and Citizenship, 1988, p. 27.

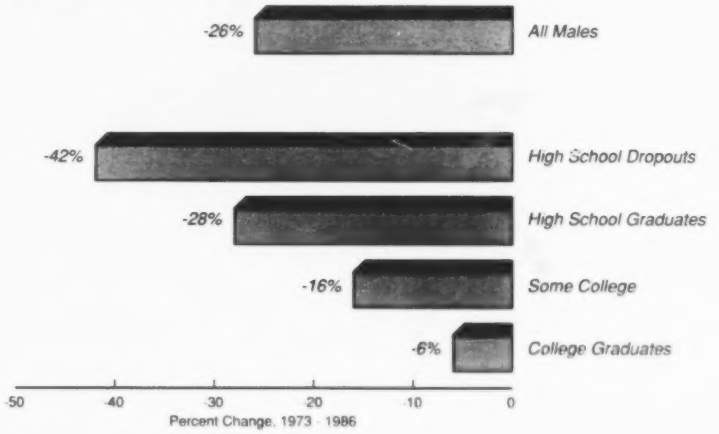
average. At the same time, those who do go on to college are increasingly also blessed with employment opportunities; by 1986 almost half of college students were also in the labor force, compared to 28 percent in 1965.

The real earnings of young workers (age 15 to 19) who work full-time for a full year have been in decline. This group includes both graduates and dropouts. While the yearly earnings of young males in constant dollars had risen from $7,308 in 1960 to $11,525 in 1975, by 1986 their earnings had dropped to $9,730. The same pattern was true for young females, with real earnings dropping from $10,682 in 1975 to $8,333 in 1986.

For the period from 1973 to 1986, *The Forgotten Half* reported highly disparate trends in earnings for 20 to 24 year old males according to the level of education received (see Table 1 and Figure 1). Real annual earnings declined by 26 percent, on average, for this age group. This decline was suffered the most by those with the least education, a drop of 42 percent. The decline for college graduates was just 6 percent; the decline for high school graduates was 28 percent.

Black males were hit the hardest, with a decline of 44 percent for high school graduates and 61 percent for dropouts.

Figure 1
Trends in the Real Mean Annual Earnings of 20-24 Year-Old Civilian Males, 1973-1986, by Educational Attainment (1986 Dollars)



Source: *The Forgotten Half*, Final Report, W.T. Grant Foundation Commission on Work, Family, and Citizenship, 1988, p. 27.

There are undoubtedly a number of factors that have contributed to the deteriorating economic position of high school graduates. Macroeconomic policy, loss of factory jobs, and changes in the occupational structure and the requirements of jobs in general are a few possibilities. But the economic data do highlight the plight of a group whose transition from school to work is insufficiently attended. The purpose of this report is to provide information that would give sharper focus to efforts to improve the institutional arrangements for the school-to-work transition.

Specifically, this report is on five aspects of the school-to-work transition:

1. *A Gradual Transition.* While we think of the transition as beginning after high school graduation, for the majority of students it begins with part-time work while they are still in school. We ask: Would greater collaboration between schools and students' employers improve education and employment preparation, and does this part-time work presently harm school performance?

2. *Classroom Skills and Workplace Skills.* We ask how much divergence there is between what is learned in school and what is needed in workplaces. What skills and abilities do employers say they want graduates to have beyond cognitive ones? Are there differences in the cognitive skills developed in school and those required at the workplace? While the answers are not all in, we draw upon some recent research dealing with these questions.

3. *Information Processing Skills.* The measures of proficiencies that come closest to matching the cognitive tasks at the workplace are those administered for the Young Adult Literacy Study carried out by Educational Testing Service and reported in 1986. Three scales of "information processing skills" were created, based on an assessment using simulations of the kinds of tasks encountered during work and in life. The performance of high school graduates on this assessment is reported.

4. *Integrating Academic and Vocational Education.* The goal of bringing academic and vocational instruction together is being pursued in a number of places in the United States; a large-scale effort is the thirteen

state experiment by the Southern Regional Education Board. Researchers and practitioners are seeking ways to take advantage of applied and hands-on learning situations to impart academic skills. An overview of these efforts is provided.

5. *Who Links Work and School?* In this section we look at the people, services, and information that help students to make a successful transition to the work world. There are, however, few resources available for this purpose and in most places, young people are cast loose to fend for themselves, although there are a few promising developments.

A GRADUAL TRANSITION

We tend to think of high school students in the United States only as students. But the majority are also workers. Fifty-four percent of all 11th graders reported that they were working in 1986 (See Figure 2), as did 66 percent of 12th graders in 1988, according to the National Assessment of Educational Progress (NAEP).*

From the standpoint of smoothing the transition to work, there are two major questions regarding this part-time work. The first regards the role that this work experience does play — or can be made to play — in easing students into full-time jobs. The second regards the ability of these students to work and go to school without impairing their academic achievement. The experience may be useful for their employment future (and could, perhaps, be made more useful), and it provides money for the students. But if the work comes at the expense of doing well in school, the benefits will be greatly diminished or the net result detrimental.

With regard to the first question, most of the jobs that students hold are obtained by the students themselves and are totally unrelated to the school. From the standpoint of enhancing employment success after graduation, we do not know a lot about the value these students obtain from the kind of work that is available to them, aside from the fact that they have lower unemployment rates after graduation than do students who do not work (at least in the first few years after leaving school). What we do know is that the school and work lives of students are entirely separate, and although the school and employer interact with the same student, little advantage is taken of this connection.

The connection is an opportunity now lost. The school can gain knowledge of deficiencies in the preparation of students for work by being in communication with their employers. Schools can also help students learn from their work experiences by discussing these experiences with them. Employers could have the opportunity to tell schools what they perceive the educational deficiencies of these students to be. It is a chance for them to have a say in improving their prospective labor force in general; in specific they may improve the abilities of young people they may want to hire full-time after graduation. Such communication would be one element in creating a much needed dialogue between schools and employers, even if these employers of part-time student workers are often not their employers after graduation. The school-work connection would also be strengthened if employers asked young job seekers how they performed in school and what courses they took. The work of John Bishop establishes that they seldom do this now; this greatly undermines the motivation to achieve.

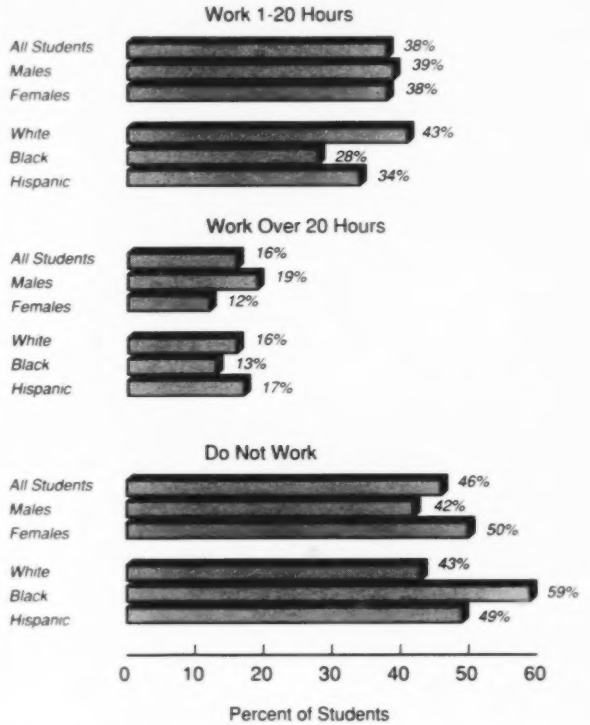
Collaborative arrangements between the school and the employers that coordinate classroom and on-the-job experiences now exist on a relatively small scale. These take different forms at the local level. One long-established program that operates nationwide is Cooperative Education, involving from 500 to 600 thousand students. Experience Based Career Education is another. Apprenticeship also relates classroom and on-the-job training, but in the United States the high school is typically not involved; apprenticeships in the U.S. tend to be available only to people well beyond the age of high school graduation (unlike in West Germany or England, for example).

The majority of high school students start their transition to work well before they graduate, and we suggest that greater advantage could be taken of this situation. But then, what is the effect of this work on the performance of students in their school work?

During the 1980's, the press stories about students working largely focused on educators'

*NAEP is administered by Educational Testing Service under a contract with the U.S. Department of Education.

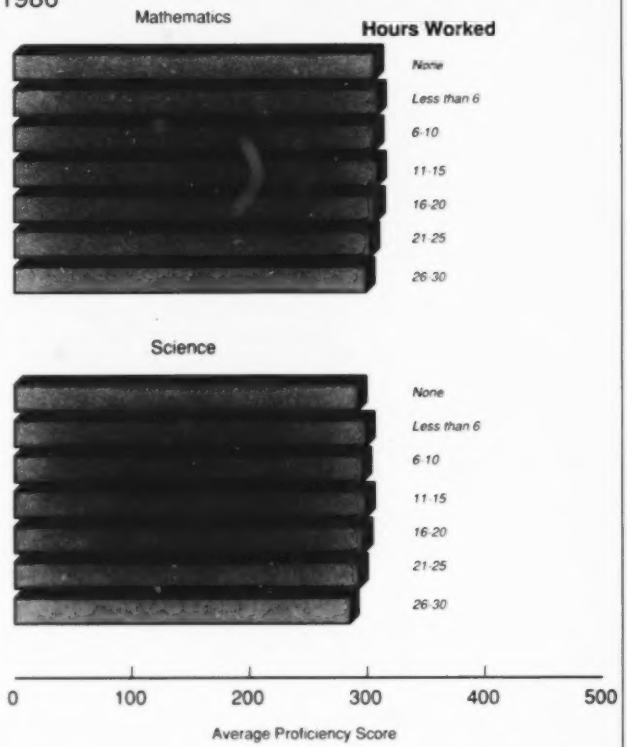
Figure 2
Percent of 11th Graders Working, by Gender and Race/Ethnicity, 1986



Source: *Learning and Learning: The Academic Achievement of High School Juniors with Jobs*, National Assessment of Educational Progress, Educational Testing Service, 1989, Table 1, p. 16.

Note: Standard errors for all data in Figures 2 through 4 are available in the source document.

Figure 3
Average Mathematics and Science NAEP Proficiency Score, 11th Graders, by Hours Worked, 1986



Source: *Learning and Learning: The Academic Achievement of High School Juniors with Jobs*, National Assessment of Educational Progress, Educational Testing Service, 1989, Table 1, p. 16.

complaints that the paid work was interfering with school work, despite several national studies that found no differences in school performance for students who worked up to 20 hours per week. (Lower performance was found in these studies for students who worked over 20 hours, but the studies were inconclusive as to whether the work caused this or whether those who worked these longer hours were different kinds of students who were already less committed to academic pursuits.)

The role that student work opportunities may have played in increasing school retention since World War II has not been examined, although both work rates and school retention rates followed a parallel upward path in the 1950's and 1960's and part of the 1970's (both have leveled off since then). If students had been forced to choose between learning and earning power, what portion of the two in three working high school seniors would have opted for earning?

Educators are appropriately concerned with the extent to which they have to compete with a string of non-academic activities, from extracurricular school activities to work to television. As a result of this interest, NAEP has reported in 1989 on the relationship between work and proficiency, based on its assessment of five subject areas, using a national sample of 29,000 11th grade students. While 54 percent of all 11th graders were working, there were variations by gender and race/ethnicity (see Figure 2). Fifty-eight percent of male students were working, compared with 50 percent of female students. Fifty-seven percent of White students were working, compared with 41 percent of Black, and 51 percent of Hispanic students.

The same pattern holds

Table 2
Average Proficiency for 11th Graders, by Hours Worked*, 1986

Hours Worked	Mathematics	Science	History	Literature	Reading
None	307	292	288	289	57
Less than 6	309	299	292	291	58
6 - 10	307	296	287	288	57
11 - 15	309	299	291	290	58
16 - 20	308	297	289	289	57
21 - 25	303	293	281	281	55
26 - 30	299	285	276	277	54

Source: *Earning and Learning: The Academic Achievement of High School Juniors With Jobs*, National Assessment of Educational Progress, Educational Testing Service, 1989, Table 1, p.16.

* The proficiency scales for mathematics, history, literature, and science range from 0 to 500, while the reading scale ranges from 0 to 100.

for the proportion working more than 20 hours per week. Male students are most likely to work long hours (19 percent); Black students the least likely (13 percent). Overall, one in six 11th graders are working over 20 hours per week.*

While other studies of the performance of working students were largely based on self-reported grades and class rank, the NAEP results come from an in-depth assessment of proficiency in specific academic subjects. This 1986 assessment included mathematics, science, history, literature, and reading. As can be seen from Figure 3, there is little or no difference in the mathematics and science scale scores of students working from one to 20 hours per week and those not working. In the case of science, working students score slightly (but significantly) higher; in other subjects assessed by NAEP (See Table 2) the differences are not statistically significant.

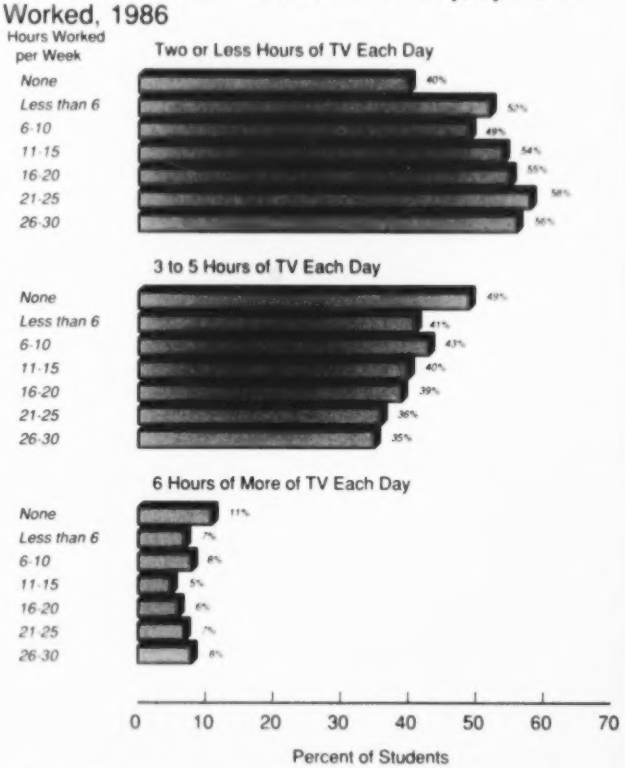
Students working long hours, more than 20 hours per week, have somewhat lower proficiency scores. According to the NAEP data, these are students who are more likely to be in the vocational track and are less likely to be taking advanced courses, such as Algebra I and II, Geometry, Biology and Chemistry. They are also more likely to say that they plan to work full-time when they leave school and are less likely to say that they plan to go to four-year colleges. While these students show less attachment to academics than those who work fewer hours or not at all, their long hours of work may have an impact on their decisions to take less of an academic curriculum. Causal relationships, however cannot be determined by this study.

How else do students who work allocate their time differently than students who don't work? How much of the work time is taken from other non-school activities, and how much from school activities? We know from the NAEP assessment that students who work watch fewer hours of television than those who do not, as can be seen in Figure 4.

One in two non-working students watches from three to five hours of television per day; this means they watch from 21 to 35 hours per week. Over one in ten watch six or more hours per day, or 42 or more hours per week. The long hours of television watching are much higher than the hours of working. While television watching is still high among students who work, it is considerably lower than among those who do not work.

Although students who work from one to 20

Figure 4
Hours of Television Watched Each Day, by Hours Worked, 1986



Source: *Earning and Learning: The Academic Achievement of High School Juniors With Jobs*, National Assessment of Educational Progress, Educational Testing Service, 1989, Table 16, P. 18.

**All comparisons made in the text are statistically significant. Standard errors for all numbers used in tables and figures are available in the source document.*

hours a week appear to perform as well as students who don't work, they do so with less time spent doing homework, according to NAEP. While 37 percent of non-workers report doing two or more hours of homework each day, this is true for 30 percent who work 11 to 15 hours, 27 percent who work 16-20 hours, and just over 20 percent for those who work from 21 to 30 hours (and who do perform slightly less well in the NAEP Assessment).

Students working more than 25 hours per week were more likely to be absent for five or more days the previous month (18 percent of them); however, there was little difference in the frequency of being absent this much between those working fewer than 25 hours and those not working at all.

The effect of work on school performance is an important question, but it is not the only one, and researchers have looked at a wide range of effects. Ellen Greenberger and Lawrence Steinberg emphasize the costs of work in their extensive studies and particularly in their frequently cited book, *When Teenagers Work: The Psychological and Social Costs of Adolescent Employment*. Ellen Greenberger is quoted as saying, in the *Houston Post* (December 9, 1989), that "The crux of our argument is that undue emphasis has been placed on the value of work experience to adolescents — and unfounded hope pinned on its singular development benefits." They also make the important point in another article ("A Job is a Job is a Job...Or Is it?") that the nature of the job students hold and the extent to which it complements schoolwork is important to their development. It is true that there was a lot of emphasis on work experience in the 1970's, with perhaps exaggerated claims; it is important now to reach a balanced judgment about costs and benefits, so that students will have the best advice possible, from parents, teachers, and counselors. The amount of work that a student can "safely" perform varies with the capabilities of the student, the demands of the school, and the nature of the job; there is likely no single rule that can be applied. And as educational standards are raised, they may be less able to work as much as they do now and maintain their school performance.

An ambitious effort, sponsored by the W.T. Grant Foundation, was made by Ivan Charner and Bryna Shore Fraser, of the National Institute for Work and Learning, to assemble and summarize all the research on the effect of students working. Except for the relationship of work to school performance in terms of subject-matter proficiency, for which NAEP provides later and better information, their conclusions from this extensive review, based on examination of 75 studies and reports, are provided below:

- Student work experience is positively associated with employment and income after completion of high school in the short range, for youth going directly into the workforce.
- Working during high school promotes desirable work habits and world-of-work knowledge and skills.
- The findings in regard to the effect of working on delinquent behavior are inconclusive and contradictory.
- Fast food employees report that parents and friends generally approve of their working.
- Generally, relationships with parents and siblings are not affected by working, albeit they do spend less time with their families.
- There is critical need for further research on the attitudinal and behavioral effects of students working in personal, school, home, community, and work domains.

The high scho
is a time when
of our students
their final educa
preparations to
work world, and
generally. It is a
when the great
begin their trans
employment. Ye
tion and employ
institutions are i
separate worlds
little or no adva
this shared invo
with students in
critical period in
growth and dev

CLASSROOM SKILLS AND WORKPLACE SKILLS

When employers criticize the educational preparation of the high school graduates they interview and hire, they are assessing those youth in terms of the kinds of things they want them to be able to do in the workplace. When educators graduate these same young people from the high schools, they are assessing their performance on the kinds of tasks presented in the school room. There is in this situation considerable room for misunderstanding between employers and educators as to what they mean when they say youth are prepared or unprepared.

To be sure, employers are often talking in the same terms as educators, and there is likely wide agreement that too high a proportion of students exit from the schools, diploma in hand, with inadequate academic skills. Employers do want adequate academic skills, including thinking skills as well as loading content into memory banks. Raising school-based academic preparation is certainly an important goal of employers, as demonstrated by the considerable number of business-supported studies and reports on education. But there are also significant areas where employers and educators are likely talking past each other, leaving a large portion of the school-to-work transition problem in the shadows.

Even after these areas are brought out into the daylight, it is not necessarily always obvious what public education should do about it. Only one of education's purposes is to prepare people to fit employers' specifications, although it is an important one. Policy makers also have to consider education for citizenship, academic preparation for post-secondary education, consumer skills, and the transmission of the culture in general, to name a few other concerns. However, any disjunctures in knowledge and skills between the classroom and the workplace must first be identified before a proper assignment of responsibility can be attempted. Some may warrant adjustments in schools. Others may legitimately require investment on the part of employers or may be deemed to be in the domain of socialization by family and community.

The National Alliance of Business, drawing the contrast, has called these skills employers want the "Fourth R, Workforce Readiness" in the title of a 1987 report. A sampling of surveys of employers and reports sponsored by employers or employer organizations will convey the kinds of skills and behaviors they are talking about.

- A Committee for Economic Development study described the traits students should acquire in school as the "invisible curriculum," and urged "schools and teachers to institute policies and practices that are specifically designed to encourage self-discipline, reliability, and other positive traits."
- In a National Academy of Science publication, *High Schools and the Changing Workplace: The Employers' Views*, the critical core competencies (in addition to the ability to read, write, compute, and master other subject matter areas) were the ability to reason; experience with cooperation and conflict resolution in groups; and possession of attitudes and personal habits that make for a dependable, responsible, adaptable, and informed worker and citizen.
- The National Alliance of Business report said that workforce readiness "includes thinking, reasoning, analytical, creative, and problem-solving skills and behaviors such as reliability, responsibility, and responsiveness to change."
- In a report that in many respects seemed to synthesize those that preceded it, the report of the American Society

for Training and Development (*Workplace Basics: The Skills Employers Want*) summarized employers' needs as follows:

- Reading, Writing, and Computation
- Learning to Learn
- Communication: Listening and Oral
- Creative Thinking/ Problem Solving
- Interpersonal/Negotiation/Teamwork
- Self-Esteem/Goal Setting-Motivation/ Personal and Career Development
- Organizational Effectiveness/Leadership.

The differences between what the schools aim to accomplish and the needs employers are expressing are seen in sharp relief in the official student record — the report card and the school transcript. By and large, students are measured according to academic performance in traditional school subjects; there is little or nothing in the record on oral communication, listening skills, or interpersonal skills, motivation, or ability to work cooperatively. Mostly, these skills are not on the schools' formal agenda, although many do come into play in successfully negotiating a high school education. Whatever the extent to which such skills may be acquired in the schooling process, there is no record of these abilities that a young person can take to an employer.

Neither is there a record of non-classroom activities and experiences that young people can convert to usable currency, the kind of experiences that provide settings for the development of some of the skills listed above. A complete record that would be of use in job seeking would include part-time jobs, school extracurricular activities, volunteer activities, etc. Existing record keeping and credentialing serve youth going on to college much more than the half who stop with the high school diploma.

There is also a lot of room for different interpretations of the cognitive skills high school graduates have acquired. Reading and mathematics often mean different things as practiced in the classroom and on the job. This is now the subject of serious inquiry by a few educational researchers. But it has likely been observed many times without becoming widely known. For example, Jerry Short, of the University of Virginia, reported disjuncture between the two in 1979, based on a series of studies he conducted for the American Telephone and Telegraph Company in 1974. His main point was that there is a need for "transferable" skills, and he called upon William James's 1899 definition of an educated person, as one who is "able practically to extricate himself by means of the examples with which his memory is stored — from circumstances in which he was never before placed."

In reading, Short found that employees said that they read in school primarily in order to be able to answer a written question related to the reading. On the job, the things they read were supposed to change their behavior. They found few situations in school which required such adaptation. Short concluded that "the experience of using written instructions to control one's own behavior under a variety of new situations clearly illustrates the high level of adaptability needed to use reading skills even in a simple, simulated job task."

In math, the AT&T employees in the study said that the "math problems in school are always in a book with all the information conveniently arranged in a brief paragraph." On the job they never found the problem so neatly defined. On the job,

the variables of a math problem came from customers, from manuals of rates and policies, from computer displays, from training materials, and from consultation with supervisors. The problem was not neatly presented in one place; it was fleeting and time-dependent . . . All of the information in a math textbook problem is relevant and must be used to solve the problems . . . This ability to filter out unneeded information is probably a critical aspect of adaptability, especially as jobs come to involve more information processing . . ."

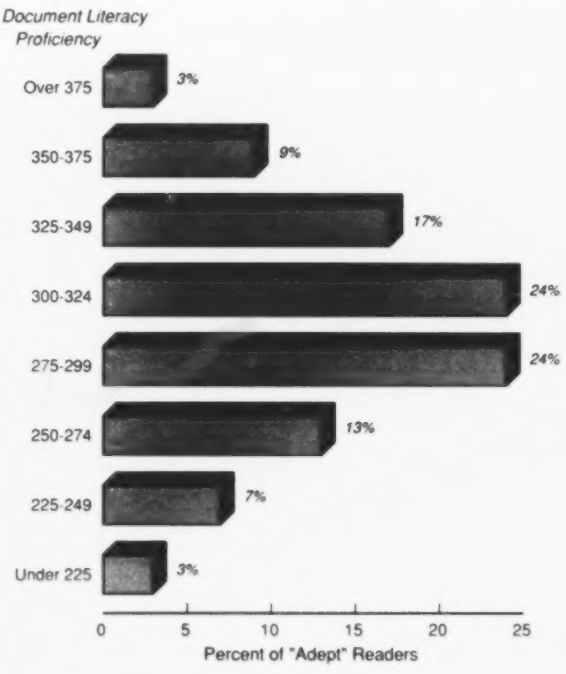
It should come as no surprise that disjunctures arise between learning in strictly classroom settings and actual problem solving. We were well warned by John Dewey that,

As societies become more complex in structure and resources, the need for formal or intentional teaching and learning increases. As formal teaching and training grow in extent, there is danger of creating an undesirable split between the experience gained in more direct associations and what is acquired in school.

New research is underway in education regarding differences between school learning and workplace application, stimulated principally by researchers Lauren Resnick, Sue Berryman and Sylvia Scribner. A 1989 report of Sylvia Scribner and Joy Stevens, *Experimental Studies on the Relationship of School Math and Work Math*, concludes that "it appears from the high level of literality observed in our studies, that school math instruction does not promote the use of expert problem-solving strategies in non-school situations."

Scribner and Stevens suggest that we need "to situate some aspects of math instruction in context of actual practice." Learning in context has adherents, and one important new approach

Figure 5
Document Literacy of Young Adult "Adept" Readers,* 1986



*"Adept" readers are defined as those that score between 275 and 325 on the NAEP Reading Scale

Source: Unpublished data, Young Adult Literacy Study, Educational Testing Service

is discussed later in this report.

Educational Testing Service, in its Young Adult Literacy Survey, funded by the U.S. Department of Education, has collected data that can illuminate one aspect of the difference between school reading and the performance on literacy tasks of the kinds encountered in workplaces and other life activities. This household assessment of 21 to 25 year olds measured proficiency in three areas: Prose Literacy, Document Literacy, and Quantitative Literacy. It did so on three literacy scales that run from 0 to 500; tasks that are likely to be performed correctly at different points along the scales are used to represent various levels of proficiency. Research has shown that Document Literacy encompasses the greatest number of literacy tasks of the kind found in workplaces. The study defined Document Literacy as follows:

The knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth.

In addition to these three literacy forms, the study used items from the regular in-school assessment of reading contained in the NAEP reading assessment. Thus, school-based reading proficiency and workplace-type literacy proficiency can be compared by taking a group of young adults with known school-based reading proficiencies and observing the range of proficiencies they display in Document Literacy. This relationship is shown in Figure 5. In statistical terms, the correlation between the two is modest.

The chart shows the distribution of Document Literacy proficiencies for young adults who are in the band of readers called "adept" by NAEP, those who read at level 300 on the NAEP reading scale. A band of scores from 275 to 325 was chosen to represent, very roughly, this adept group of readers, with some slightly above and some slightly below that level (even readers at the 250 NAEP level are "intermediate" readers, and "can search for, locate, and organize the information they find in relatively lengthy passages and can recognize paraphrases of what they have read"). Just two in five 17-year-old high school students are "adept" readers, as are over half of all young adults, age 21 to 25. Adept readers are good readers; according to NAEP they:

Can understand complicated literary and informational passages, including material about topics they study at school. They can also analyze and integrate less familiar material and provide reactions to and explanations of the text as a whole. Performance at this level suggests the ability to find, understand, summarize, and explain relatively complicated information.

How literate are adept readers on tasks that involve documents requiring the kind of information processing skills encountered at the workplace? About 12 percent perform at level 350 or higher on the Document Literacy scale, and are able to perform tasks such as using six features of a bus schedule to get to a particular place on time. Sixty-five percent were in the 275 to 349 score range, able to do tasks ranging from using a sandpaper chart to locate an appropriate grade with given specifications (high end of the range) to using an index from an almanac (low end of the range). Twenty-three percent of these good school readers scored below the 275 level, where only relatively simple tasks can be performed, such as locating gross pay-to-date on a pay stub, entering data on a deposit slip, and matching items on a shopping list to coupons.

In short, the Document Literacy skills of these good readers fall within a wide range and, for too

many of them, are not very impressive. A third to a half of them could do only relatively simple literacy tasks — depending on where individual judgment would draw the line as to the degree of complexity these tasks represent. Reading proficiency as we teach it and measure it in school is not synonymous with workplace literacy. This may be why so many high school graduates are judged by employers to have such inadequate literacy skills.

A considerable number of workplace competencies have been discussed that are often not part of the schooling experience. Certainly, there is no record of such competencies, similar to the report card or the SAT, for those going directly to work to take to prospective employers and employment agencies. Such a report or credential is a link not yet made between the school and the workplace.

INFORMATION PROCESSING SKILLS

There is considerable dissatisfaction with the cognitive abilities of the young people employers see coming out of the high schools, as well as dissatisfaction with other characteristics and abilities they desire them to have. The discussion of these abilities is usually put in terms of the subjects they study, the grades they receive, and the proficiencies they have in school subjects measured by standardized tests. We have seen from the previous section that school-based abilities are not always the same thing as workplace abilities, and that this may be the source of some misunderstanding.

Employers seem to be talking about the ability to solve problems in the practical situations entry level workers find themselves in. They refer to "problem solving" skills, and to "critical thinking." They tend to think in terms of what these prospective employees can do in real life settings, and not what they know in school settings. Since most all of the measurement and reporting has been school-based, the information with which to view them from this perspective is not frequently obtained. One exception is the national-level information from the Young Adult Literacy Study conducted by Educational Testing Service, and referred to in the previous section.

The concept of literacy used by the authors of this report, Irwin Kirsch and Ann Jungeblut, is very close to what a great many employers are talking about, and quite different than traditional measures of "illiteracy" — the simple inability to read. This study of 21 to 25 year olds, using open-ended exercises, involved the administration of a broad range of simulation tasks. The authors speak in terms of the "information processing skills" these young adults demonstrate, not in terms of reading comprehension of school materials and doing computations found in mathematics textbooks. These simulation tasks included prose, document, and quantitative problems commonly associated with a broad range of printed materials, including newspaper stories, manuals, charts, tables, indices, announcements, forms, and so forth; proficiency is reported on scales of from 0 to 500.

Thomas G. Sticht, one of the foremost literacy experts in the United States, commented on the significance of this "information processing skills" approach used in the ETS analysis:

The study's authors provide an 'information processing' analysis of the literacy tasks and show how failure to perform correctly reflects these information processing demands. This is a signal contribution because it provides directions for instruction that go well beyond the traditional concepts of 'remedial literacy' as decoding sights to sounds or producing and comprehending oral histories and the like. What this study suggests is that the performance of literacy tasks involves difficult information processing such as locating the correct information in complex displays of print, holding information in 'working memory' while finding additional information, transforming these fragments of information into new knowledge, and then writing or otherwise communicating the results of these complex, cognitive activities. And frequently this will involve not just the reading of textual materials, but the study of tables, graphs, and the performance of computations in order to complete a literacy task.

While this assessment of young adults focused on all those from 21 to 25 years old, what follows is information about the portion that are high school graduates and/or had some postsecondary experience, but who did not obtain any kind of a postsecondary degree. While the results thus somewhat overstate the proficiencies of those who graduated from high school and did not enter postsecondary education at all, this group comes closest to the pool of workers employers see coming directly to them from high school. For purposes of identification, we will simply call them high school graduates. The specific results on each of the three literacy scales will be provided below.

PROSE PROFICIENCY

The prose simulation tasks in the assessment were of three kinds:

1. *Locating information in a text.*

Readers were given information in the form of a question. This had to be matched with identical or corresponding information located in a text.

2. *Producing and interpreting text information.*

The young adults were called upon to produce a response that supports an idea, using a combination of background and text information. The simplest was asking them to write a brief description of a job they would like to have.

3. *Generating a theme or organizing principle from text information.*

Successful performance of these tasks requires synthesis of information to generate a theme that is consistent with arguments provided in a text. A somewhat difficult example requires the synthesis of the main argument of a lengthy newspaper column.

Prose proficiency levels are shown in Figure 6. Practically all high school graduates could do the simplest tasks, around the 200 level on the Prose Scale; they could do tasks such as writing a description of a job they would like to have. More than four out of five were at or above the 225 level where they could do tasks such as locating information in a sports article. But they began to thin out as the tasks become somewhat more complex. Nearly three out of four were estimated to be at the 275 level, demonstrated by successfully writing a letter to state that an error has been made in billing. About two in three could handle tasks such as synthesizing the main argument from a lengthy newspaper column. To do this task they were given the account by Tom Wicker entitled, "Did U.S. know Korean jet was astray?" (See Figure 9). Only about three percent of the high school graduates were able to orally interpret the distinctions between two types of employee benefits, a task illustrating the 375 level.

Figure 6
Prose Proficiency of High School Graduates without Postsecondary Degrees, 1986

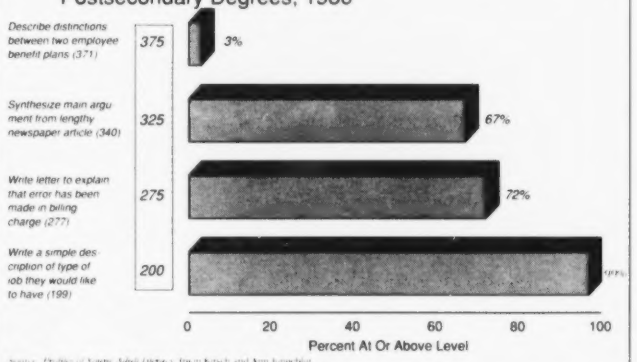


Figure 7
Document Proficiency of High School Graduates without Postsecondary Degrees, 1986

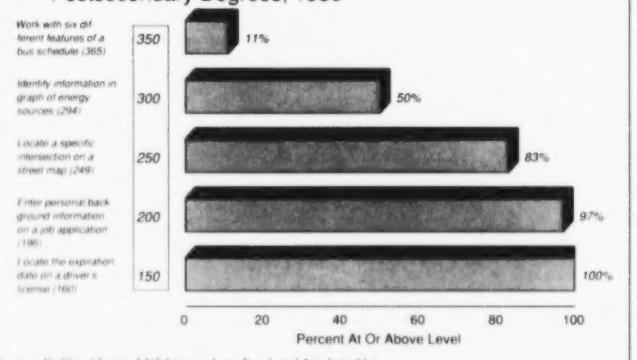
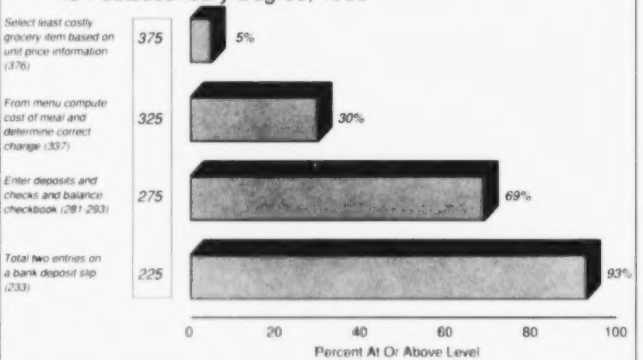


Figure 8
Quantitative Proficiency of High School Graduates with no Postsecondary Degree, 1986



DOCUMENT PROFICIENCY

Practically all high school graduates could perform simple tasks involving documents. For example, they could locate the expiration date on a drivers license, locate the time of a meeting on a form, enter a caller's number on a phone message form, locate a movie in the TV listing of a newspaper, and enter personal information on a job application. High school graduates could do simple literacy tasks; practically none of them are "illiterate" in the use of documents. Their skills, however, began to weaken with moderately complex tasks (See Figure 7).

Figure 9

Did U.S. know Korean jet was astray?

Tom Wicker

THE COMPLICITY with government into which the press has sunk since Vietnam and Watergate has seldom been more visible than on the first anniversary of Soviet destruction of Korean Air Lines Flight 007.

On Sept. 1, headlines, of course, reported the Reagan administration's statements that the event had boosted, during the year, U.S. standing in the world relative to that of the U.S.S.R.

But the press effectively ignored an authoritative article in The Nation (for Aug. 18-25) establishing to a reasonable certainty that numerous U.S. government agencies knew or should have known, almost from the moment Flight 007 left Anchorage, Alaska, that it was off course and headed for intrusion into Soviet air space, above some of the most sensitive Soviet military installations.

Yet no agency, military or civilian, warned Flight 007 or tried to guide it out of danger; neither did the Japanese. As late as Aug. 28, in a briefing, a State Department spokesman claimed "no agency of the U.S. government even knew the plane was off course and was in difficulty until after it was shot down."

If that's true, the author of The Nation's article, David Pearson, an authority on the Defense Department's World Wide Military Command and Control System, who spent a year researching his lengthy article, concludes, "the elaborate and complex system of intelligence, warnings and security that the U.S. has built up over decades suffered an unprecedented and mind-boggling breakdown."

But Pearson shows in excruciating detail why it's most unlikely there was any such "simultaneous failure of independent intelligence systems" of the Navy, Army, Air Force, National Security Agency, Central Intelligence Agency "or the Japanese self-defense agency" — all of which, he shows, had ability to track Flight 007 at various stages across the Pacific.

What's the alternative to the staggering idea of such a breakdown? That all these agencies deliberately chose not to guide the airliner back on a safe course, because its projected overflight of the Kamchatka Peninsula and Sakhalin Island would activate Soviet radar and air defenses and thus yield a "bonanza" of intelligence information to watching and listening U.S. electronic devices. Despite all administration protests to the contrary, the evidence Pearson presents raises this alternative at least to the high probability level.

But Pearson does not assert as a fact that the United States, South Korea or both deliberately planned an intelligence mission for Flight 007; he concedes the possibility that it simply "blundered" into sensitive Soviet air space, and that electronic onlookers for the United States decided on the spot to take intelligence advantage of the error, never dreaming the Russians would shoot down an unarmed airliner.

But if the disaster happened that way, Pearson notes, two experienced pilots (nearly 20,000 flying hours between them) not only made an error in setting the automatic pilot but "sat in their cockpit for five hours, facing the autopilot selector switch directly in front of them at eye level, yet failed to see that it was set improperly." Nor in all that time could they have used the available radar and other systems to check course and position.

Pearson also presents substantial evidence that Soviet radar detection and communications systems over Kamchatka and Sakhalin were being jammed that night, which would help account for their documented difficulty in catching up to Flight 007. He reconstructs electronic evidence too, to show that the airliner changed course slightly after passing near a U.S. RC-135 reconnaissance plane, otherwise it would have crossed Sakhalin far north of the point where a Soviet fighter finally shot it down.

The jamming and course change, as detailed by Pearson, strongly suggest what he obviously fears: "that K.A.L. 007's intrusion into Soviet air space, far from being accidental, was well orchestrated," with the Reagan administration, at some level, doing the orchestrating. Even if not, the deliberate silence or shocking failure of so many U.S. detection systems argue that President Reagan and the security establishment have greater responsibility for Flight 007's fate than they admit, or that a complaisant press has been willing to seek.

Copyright 1984 by The New York Times Company. Reprinted by permission.

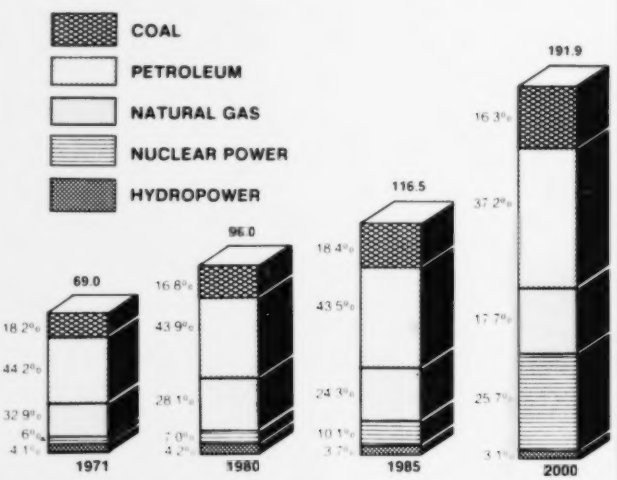
The great majority, just above four out of five, reached or exceeded the 250 scale level, where they could locate a specific intersection when given a street map. But half dropped out by the 300 level, where they were called upon to identify information in a graph of energy sources (see Figure 10).

Just over one in ten reach the 350 scale level. The task roughly representative of this level involved a city bus schedule. The question was: "On Saturday afternoon, if you miss the 2:35 bus leaving Hancock and Buena Ventura going to Flintridge and Academy, how long will you have to wait for the next bus?" Six features of the bus schedule were essential to getting the correct answer.

The Project Director of the Adult Literacy Study, Irwin Kirsch, says that "research indicates that adults across a range of educational backgrounds and occupations report spending more time reading documents than prose." Employers can expect high school graduates to deal successfully with simple tasks involving documents. But as these documents increase in complexity, the information processing skills required exceed the abilities of large proportions of high school graduates to cope with tasks that seem only moderately complex, such as the use of the graph on energy sources.

Figure 10

Estimated U.S. Power Consumption by Source



In the year 2000, which energy source is predicted to supply less power than coal?

A Petroleum
B Natural gas
C Nuclear power
D Hydropower
E I don't know.

QUANTITATIVE PROFICIENCY

The quantitative tasks illustrating the scale levels depicted in Figure 8 are of the kind encountered in everyday living. The performance of high school graduates on these tasks were not encouraging. Ninety-three percent reached or exceeded the 225 level, where the representative task merely requires totaling two entries on a bank deposit slip. Only seven out of ten reached the 275 level, however, where a harder task involving a checkbook required a) entering one deposit, b) entering two checks, c) entering the monthly service fee, and d) keeping a running total of the balance.

The task that typifies the 325 scale level is the use of a menu to figure how much a two-item meal costs and how much change should be received (See Figure 11); Just three in ten of high school graduates were at this level. Level 375 was attained by only five percent. A task at that level requires dealing with unit pricing information in a grocery store, a need of every consumer.

While practically all high school graduates can do simple simulation tasks involving prose, documents and quantitative problems, they begin to fail as the information processing skills required become more complex, particularly on tasks involving documents and quantitative problems. The adequacy of these skills depends on the requirements of the workplace, and those requirements vary greatly among entry level jobs in different occupations and industries. We do believe, however, that information on proficiencies, in terms of the kinds of simulation tasks described above, will facilitate more direct judgments about the workplace competencies of entry level workers than will performance in traditional school settings alone.

Figure 11

A task typical of performance at the 325 level requires the reader to examine a menu to compute the cost of a specified meal and to determine the correct change from a specified amount (337). The difficulty of such tasks reflects the need to match information and then to apply two operations in sequence.

Suppose you had $3.00 to spend for lunch.

If you order a Lancaster Special sandwich and onion soup, how much change would you get back?_____

How much should you leave for a 10% tip?_____

Soups — Made by our Chef Daily

Onion soup	.60
Soup of the day	.60
Vichyssoise in Summer	
Beef-burgers, broiled to order;	1.85
1/4 lb. of the finest Beef available, seasoned to perfection and served on a buttered bun	
Wine Cheddar-cheese burger	1.95
Blue-cheese burger	1.95
Pineapple burger	1.95
Bacon burger	2.10
Wine Cheddar-cheese & Bacon burger	2.25

Sandwiches

Sliced Turkey — Garnished	1.30
Turkey Salad — Garnished	.95
Chicken Salad — Garnished	.95
Tuna Fish Salad — Garnished	.95
Sliced Beef Tongue — Garnished	1.50
Grilled Wine Cheddar-Cheese	1.95
The Lancaster Special	1.95
Corned Beef, Melted Swiss Cheese, Saurkraut on Seeded Rye . . . Need we say more?	
Minimum Check at Lunch	1.00

What this information seems to indicate is that while "illiteracy" is not a problem, a high proportion of our high school graduates are low-level literates, unable to do tasks commonly required in day-to-day living. It is not surprising that employers frequently complain about the inadequate preparation of many of these graduates when they apply for employment.

INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION

While research is underway that may support a concept of learning tied to experience and application, a beginning is being made in the schoolroom. While practice may be increasingly informed by research, it is not waiting for it. A combined approach has advocates; the recent report, *Training America**, states:

Employers have long been advocates of an applied pedagogy. They argue that learning that occurs in some functional context produces better students as well as better employees.

In the American high school there has been a wall between academic/general education and vocational education. This division has roots in both history and in the differing outlooks of the professionals on each side of the wall. The historical origins stem from the fact that vocational education was created by Federal edict and run by a Federal Board of Vocational Education, when all other public education has emanated from states and localities. The professional differences have arisen over a tendency of a great many in vocational education not to see value in academics that do not have obvious application, and a belief on their part that their students would not sit still for academic coursework. On the academic side, there has been a tendency to belittle vocational education as being second class, or to believe that this was not the best way to prepare for employment. Critics have found faults with vocational education on other grounds as well, and new state and Federal legislation is regularly reshaping it.

Another set of criticisms has been leveled at the passive nature of high school academic coursework, particularly as these practices affect those less enraptured with the pursuit of knowledge. Perhaps John Goodlad's exhaustive study, *A Place Called School*, is the most authoritative report. Goodlad describes how he would react to such passive learning:

I would groan audibly over still another seatwork assignment. My mind would wander off soon after the beginning of a lecture. It would be necessary for me to put my mind in some kind of "hold" position. This is what students do. Films of relatively good frontal teaching (lecturing and questioning the total class) clearly reveal how quickly many students turn their minds elsewhere or simply doze.

Goodlad argues that to achieve interest and involvement, subject matter needs to be made relevant, students need to be involved in setting their own goals, teaching methods need to vary, and there need to be opportunities for relating knowledge to experiences.

There is increasing agreement that those students not going on to postsecondary education are not well served by their high school experience. The watered-down general track produces a thin education and no occupational skills. Those in the vocational track may get some occupational education, but are not likely to get the mathematics, science, and communication skills they will need to progress beyond entry-level employment (and their options for postsecondary education are often — but not necessarily — curtailed).

The occupational courses are not offered in a planned sequence that leads to a skill in demand in the market place; more likely, students pick and choose from the offerings and end up with little more than a sampling of occupational content. The general education courses they take are unrelated to the content of their occupational courses. A state and national leader in vocational education, James E. (Gene) Bottoms, puts the situation this way:

No attempt is made to help students select mathematics and science courses that would complement their vocational studies, nor are efforts made to help students see the connection between their academic and vocational courses . . . . On average, vocational students take about three fewer academic courses than do other students

and

[Based on an analysis of transcripts of students graduating from a large urban school system]. General and vocational students are floating in and out

*Published by the National Center on Education and the Economy and the American Society for Training and Development.

of a variety of vocational courses at random, never staying long enough to gain any in-depth intellectual, academic, or technical knowledge or competencies in any given area.

The result, Bottoms says, is "a random education that does not provide students with an organized, sequential, and coherent program that could lead to a career as opposed to simply an entry level job."

Bottoms directs the largest effort underway to integrate academic and vocational education into a new formulation that may need a new name. It is a project of the 13-state Vocational Education Consortium of the Southern Regional Education Board (SREB), involving 33 secondary schools. Educational Testing Service, using tests and questionnaires from the NAEP, has assessed almost 3,100 seniors in these high schools who are designated as "vocational education completers," seniors who had completed four or more Carnegie units in a vocational concentration. Findings include:

- Just under half of the students reported that their teachers stressed taking mathematics courses.
- Under three in ten reported that teachers are stressing science.
- Students reporting that their teachers stressed the importance of mathematics and science had higher scores in these subjects than those reporting that their teachers didn't.

The Consortium concluded that "state leaders should continue a strategy designed to assist and encourage vocational teachers to use teaching methods that cause students to use basic competencies in their vocational studies." Designing, implementing, and evaluating a program that integrates academic and occupational instruction is the purpose of this long-term SREB project. The sights of educators in these lead states have been raised, adopting a goal of both preparing youth for immediate employment *and* preparing them for continued learning in either a work or educational setting. This will go a long way toward bringing the academic and vocational sectors together in pursuit of a shared goal.

The SREB has set specific short-term goals for its member states:

- Raising significantly the competencies of vocational education completers in reading, science, and mathematics, as measured by the National Assessment of Educational Progress.
- Increasing the percentage of vocational completers who continue their education within one year after high school completion.
- Doubling the percentage of vocational students who take one or more college preparatory mathematics and science courses or courses designed to teach similar content through an applied process.
- Increasing by 50 percent the number of vocational completers who report that their vocational teachers often stressed mathematics, reading, writing, and science concepts.
- Evaluating and revising the ways that vocational education teachers are prepared, licensed, and updated, with the emphasis on improving their academic competencies and their skills for reinforcing them.

In 1989, Nancy E. Adelman of the Policy Studies Associates, Inc., published findings from five case studies of what were considered to be among the best efforts to date to integrate academic and vocational education. In defining objectives and selecting sites, the study avoided the use of the term "basic skills," which often connotes minimum skills. The term "academic skills" was used to mean thinking, problem solving, and comprehension, as well as the "three Rs", and a higher level of difficulty — algebra, for example, as well as general math. The major features of these five programs are summarized below.

- *Montgomery County Joint Vocational School in Dayton, Ohio*

  Ohio has a statewide, but optional, integration effort. The Montgomery County program was chosen for a case study. The school requires that academic and vocational teachers work closely together. Vocational teachers are present during periods of academic instruction and teaching is often done in teams. Academic teachers are encouraged to observe both vocational classes and worksites, and they work entirely with students in a specific occupational cluster. Curriculum materials are developed on-site, with an emphasis on making the relationship between academic and vocational skills explicit.
- *The Health Academy at Oakland California's Technical High School*

  While the program is targeted to at-risk, disadvantaged, and underachieving students, it is "an intensive college preparatory academic/technical program with an applied emphasis." The Academy escalates expectations for these students, nearly all of whom failed two or more classes in the ninth grade. In addition

to the minimum requirements, students take an additional unit of math, four additional units of science, and a half unit of computer education. Seniors may participate in an advanced health course in cooperation with Kaiser Hospital, which includes rotating internships. Of the first 42 graduates, 20 enrolled in the University of California, 12 were going to community colleges and seven took full-time jobs; one student failed to graduate from high school.

- *Schenley High School in Pittsburgh, Pennsylvania*

  Schenley operates a four year "high tech" magnet program emphasizing integration of academic and technical content in teaching electronics. There is a choice between a college preparatory "professional" program or a technical program for either employment or postsecondary vocational training, but without large differences between the two. English, math, and science courses are integrated with the technical education courses. English classes emphasize technical and business writing. So far, the school has experienced considerable attrition, however.

- *Dauphin County Technical School in Harrisburg, Pennsylvania*

  Dauphin is an area vocational school with about 800 students that is also comprehensive; students take all their academic courses there. The school has undergone a radical restructuring, eliminating traditional departments and organizing all faculty into four occupational clusters: technical, service, construction, and communication and transportation careers. Students alternate, each week, between academic and vocational instruction. While the vocational side has long been "competency based," competencies are being defined for the academic courses as well. The time frame for the experiment was five years, but has been extended to ten because it was realized that the restructuring was a massive undertaking. No rigorous evaluation has yet been undertaken.

- *New York State*

  In the early 1980's New York revised its entire occupational and technical education program around the proposition that "transferable" skills would be required in a future where workers would have to be adaptable to change. A set of core competencies were specified in personal development, social systems, information systems, resource management, and technology. These competencies were to "crosscut" all the specific occupational programs.

These five programs, the SREB 13-state effort, and other integration efforts are beginning to build a solid foundation of experience that could form the basis for a restructured curriculum at the high school level, particularly for those who do not expect to go the academic route. It also offers hope of a system that prepares students for employment without limiting options for a postsecondary education.

This integration of academic and vocational instruction is discussed here in terms of adding to the capabilities of students expecting to go directly into the work world. However, the passive nature of learning in the classroom described by John Goodlad is a problem for the college-bound youth as well; many of them need the benefit of opportunities for more active learning environments.

WHO LINKS SCHOOL AND WORK?

Today young people grow up in families where parents' jobs are usually a remote abstraction, unlike on the farm or in the family business when the family lived upstairs from it, or the factory where tangible things were made that children could touch and see. They most likely go to large schools generally isolated from society, where the school staff have little experience outside education. There are notable — and not so notable — exceptions, but this remains the typical condition under which these graduates transfer from an institution where their development is planned and aided by teachers to a labor market where they are thrown on their own resources.

Most developed countries have highly structured institutional arrangements to help young people make this transition; it is not a matter left to chance. West Germany does it through the apprenticeship system, combining classroom work and on the job instruction. In Japan, the schools themselves select students for referrals to employers, under agreements with employers. In other countries, there is either a strong employment counseling and job placement function within the school system or this function is carried out for the students by a labor market authority of some type, working cooperatively with the schools.

To be sure, there are some school systems that have developed good linkages to the work world, often found in the guidance offices of vocational education schools or as the natural operation of cooperative education programs. But the general pattern has been one of doing a whole lot more to link high school students to college than to work.

The United States Employment Service, created in 1933, made a start in 1950 on what seemed to be the beginning of a productive partnership with the schools. Under this cooperative program, the service entered the schools and registered seniors not going on to college for job placement. Depending on the needs of students, it offered employment testing and counseling services as well. This was a limited, "one-shot" service, but it could have evolved into something much more substantial. By 1963, the effort encompassed half of the nations' high schools and 600,000 high school seniors.

This promising start began to crumble under a number of pressures. For one, Employment Service priorities were turned toward disadvantaged clients. Unemployment among out-of-school youth emerged as a national problem, particularly among drop-outs. The final blow was huge reductions in Federal appropriations for the Employment Service in the early 1980's; its 3,000 or so offices are supported entirely with Federal funds. Statistical reports on this high school program were abandoned as funds were drastically slashed. Even the remnants of activity in the local offices now goes unreported at the Federal level.

A recent effort of the Employment Service to identify innovative undertakings by state and local offices turned up a few activities:

- In Missouri, the Employment Service has assigned a full-time representative in each Area Vocational-Technical High School, as part of a combined guidance and placement effort. The representative provides instruction in pre-employment skills and job search strategies.
- The Arizona Employment Service has two career development and placement services for youth age 16 to 21, serving both in-school and out-of-school youth. It is co-sponsored by the State Education Department and the Job Training Partnership Act program.
- The Rhode Island Job Service operates a program for high

school seniors on a statewide basis. It is principally a career exploration and job search instruction program.

- New York Youth Opportunity Centers, a joint initiative with the New York City Partnership, provide high school students with computerized occupational information, job search workshops, and a resource center to help develop career plans. The staff develop both part-time and full-time employment opportunities for students and recent graduates.

Employment assistance to departing high school students never developed as a regular responsibility of the schools. As Willard Wirtz put it in 1975, "the almost exclusive reaction has been to leave youth job placement to the Employment Service, where it has been accepted as not better than an unwanted child." At the time "Career Education" was emerging, but that also remained limited and slowly slipped in the educational priorities, even before it was fully defined.

In the last half of the 1970's, the National Manpower Institute (now the National Institute for Work and Learning) launched "Community-Education Work Councils" as a collaborative effort among schools, employers, unions, and other community institutions. While this preceded a period of increased school-employer collaboration in improving education (if not the school-work transition), this particular approach itself remained limited, and in many places short-lived, after support provided by the U.S. Department of Labor ceased.

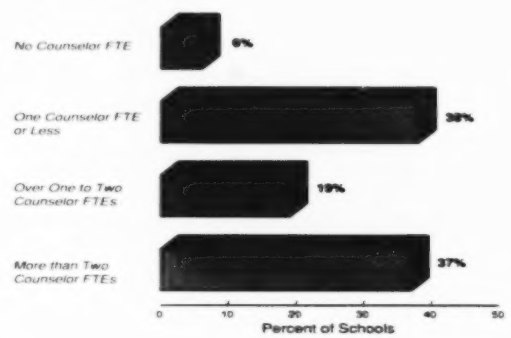
There has been no regular reporting of what is going on in the nation's school system regarding the availability of employment counseling, the provision of occupational information, and the effectiveness of job placement. Much more information will be available in the future, however, as a result of initiatives underway by the National Center for Education Statistics. The new Schools and Staffing Survey (SASS) will pretest the collection of data on the number of full- and part-time vocational counselors in 1990; the 1988 survey provides information only on the total full-time equivalents of guidance counselors. The National Education Longitudinal Survey (NELS:88) began with a survey of eighth graders in 1988; the 1990 follow-up of these same students will contain questions on counseling services and their use, both at the student and school level. The 1984 follow-up survey of the High School and Beyond (HSB) study contains information about counseling services; to our knowledge it has not yet been analyzed. These NCES initiatives will result in a huge expansion of information about this critical transition service.

A national study of career information systems authored by Warren Chapman and Martin Katz and sponsored jointly by the National Institute of Education and the National Occupational Coordinating Committee, was carried out in 1980 and reported in 1981 by Educational Testing Service. This comprehensive report created a base-line of solid information and is used here to examine the status of employment counseling in the schools.

An essential element indicating the resources available for helping non-college-bound students is the availability of counselors in the schools. While just one in 17 schools had no counselors, almost four in 10 had one or less, and over six in 10 had two or less (see Figure 12). This is a thin resource given all the demands on counseling time. Helping students choose their high school courses gets the most attention from counselors, followed by college selection and admission, followed by attendance and discipline problems. Next comes assistance in occupational choice and career planning. Dead last is job placement (See Figure 13).

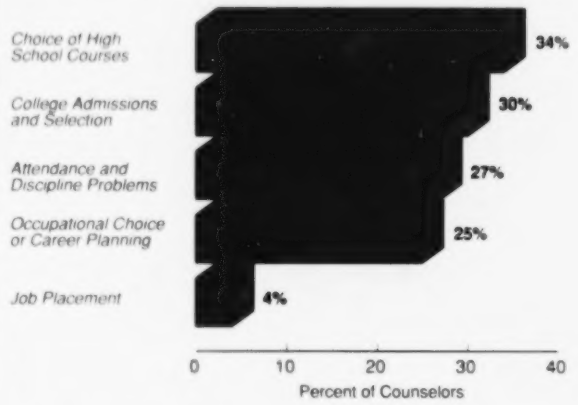
While job placement and career choice for the non-college-bound is not ignored, it is a relatively undeveloped aspect of counseling in the high

Figure 12
Full-Time Equivalents (FTEs) of Counselors in High Schools, 1980



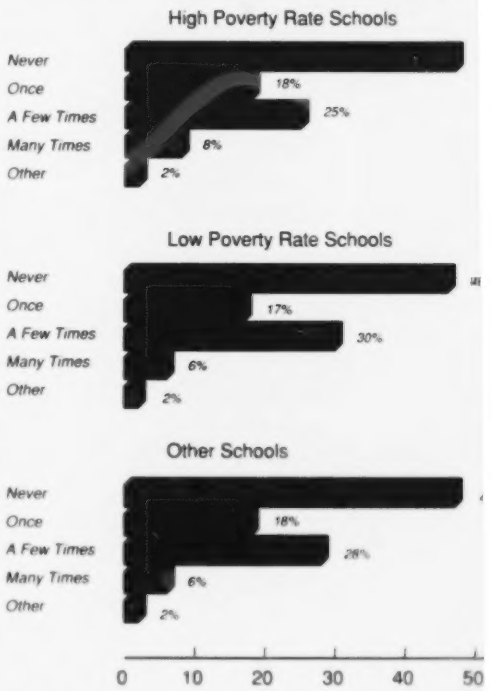
Source: Warren Chapman and Martin R. Katz, *Survey of Career Information Systems in Secondary Schools*, Educational Testing Service, 1981, p. 538-559.

Figure 13
Activities at Which Counselors Spent More than 30 Percent of Their Time, 1980



Source: Warren Chapman and Martin R. Katz, *Survey of Career Information Systems in Secondary Schools*, Educational Testing Service, 1981, p 536-559

Figure 14
Percent of High School Students Who Talked Counselor about Occupations, Central City Sc



Source: Warren Chapman and Martin R. Katz, *Survey of Career Information Systems in Secondary Schools*, Educational Testing Service, 1981, p 429

schools. While counselors, in some places, are helping the non-college-bound, services are clearly heavily weighted to other functions. These findings about how counselors spend their time are mirrored in what the students report, based on information coming from the same ETS study (see Figure 14). In central city schools, almost half of high school students never talked with a counselor about occupations.

If students don't talk to counselors about such matters, whom do they talk to? About half talked with their friends "many times." More than half talked with their parents or relatives. Almost none talked with Employment Service counselors. About half had never talked with employers about occupations. Their sources of information are informal, and certainly not people in a position to know the range of occupations in a labor market and how to gain access to them. When young people are asked how they got their first job, by far the largest answer is "through friends and relatives."

Working with the limited supply of counselors, the National Occupational Information Coordinating Committee (NOICC), through its state counterparts, tries to get occupational information into the high schools. NOICC has provided training in the use of occupational information to over 3,000 counselors, and over 30 states distribute NOICC's Career Development Guidelines for improving career guidance and counseling programs to the schools.

The 1980's was a decade of reform in the content of schooling, and the "transition to work" theme disappeared from the agenda until it emerged again very recently. The earlier watering down of the high school curriculum had become a threat to employability, and of great concern to employers. Vocational education received little attention during the reform period and educators in the field were preoccupied with preventing the "excel-

lence movemen
eroding its finar
resources, altho
revival of intere
underway, parti
the integration
demic and voca
instruction. On
ployment side,
programming c
to target money
income, "disadv
populations. Ne
tions providing
chance services
outs struggled t
their footing un
onslaught of Fe
budget cuts. Wh

have no solid data on what happened in the school system regarding employment counseling and job placement during the 1980's, there were likely few changes of great magnitude. We do know from transcript studies, however, that formal course offerings in career awareness and orientation declined somewhat.

Only one national initiative has emerged thus far to deal directly with the transition, inspired by a program in Delaware. Under Governor Du Pont, Delaware had launched a successful program called Jobs for Delaware's Graduates. It brought the business community and the schools together to provide realistic employment counseling by knowledgeable people, placement in jobs, and follow-up for a two year period. Support clubs were organized among students, modeled on vocational education clubs, such as those of VICA (Vocational and Industrial Clubs of America).

Before the mid-1980's, Jobs For America's Graduates was formed to take the same approach nationwide. Its focus was on those seniors not planning to go to college; it had no narrow targeting, a characteristic of efforts to help youth in the 1980's — whether by the Federal government or by foundations. The program was operating in 16 states by the end of the decade. Two hundred ninety schools were involved, and the program was serving 11,000 seniors. Its placement rate varied from 48 percent to 89 percent, depending on local labor market conditions. The overall "positive outcome" rate for the combined pool of high school graduates was approximately 83 percent in the last reporting period. Nevertheless, 17 percent of the combined pool was unemployed, indicating that more is involved than the delivery of these transition services. While this is an across-the-board program for high school seniors not bound for college, over half of those served are Black students, probably reflecting the fact that the program is heavily concentrated in cities.

Another significant development of the last decade was the Boston Compact, signed by the city's schools and employers in 1982. According to the National Alliance of Business, which is helping other cities create similar "Compact" arrangements,

Boston leadership reached an agreement that the purpose of the school system was to keep young people in school and provide them a quality education that would enable them to go on to work or college. Educators and business leaders agreed that jobs were needed along with a support network to help these youth gain access and make the transition. They acknowledged that the labor market does not function well for low-income and minority young people — neither they nor the employers have adequate knowledge or information about the other.

Under the Compact, the employers would promise jobs and the schools would promise to improve education. Measurable goals were established for each partner. The initial employers' goals were to:

- Recruit, within a year, 200 firms pledging to give Boston high school graduates priority hiring status.
- Hire, within a year, 400 Boston high school graduates, and increase summer jobs from 750 in 1982 to 1,000 in 1983.

The schools were to:

- Improve the daily attendance rate by five percent per year.
- Reduce the dropout rate by five percent per year.
- Improve academic performance in math and reading.
- Improve college placement rates by five percent per year and job placement rates by five percent per year.

Currently, from 600 to 700 businesses are involved in the Compact. William Spring, an originator of the Compact, says that three ingredients are essential to a successful program:

1. There must be strong business commitment, and enough employers must be involved to be able to offer jobs to the graduates, without any one employer having to do too much.

2. There must be competent people stationed in the schools to work with individual students — people the employer trusts when referrals are made. They speak at assemblies, they arrange part-time and summer jobs, and they develop jobs for graduates throughout the community.

3. There must be specific goals and the documentation of progress. There must also be documentation for each student who is placed, and each student must be followed up to see how he or she does.

The program has been thought to be generally successful in Boston but is not without its problems, and some renewed negotiation between the schools and the employers has taken place. Currently, the National Alliance of Business is working with 12 cities on Compact approaches. While no effort is being made to precisely duplicate the program approach in Boston, a similar process of collaboration between schools and employers is being attempted in these communities.

The U.S. Department of Labor has recently assigned a high priority to improving the school-to-work transition. Its Employment and Training Administration recently established a new Office of Work-Based Learning, as a focal point for the Department's job and training partnerships with the private sector. One of its principal tasks will be "to assist young people with their school-to-work transition so that they can move into productive careers and upgrade their job skills." The Director of this new office, James D. Van Erden, in *Work-Based Learning: Training America's Workers*, made as a principal recommendation the expansion of "structured work-based training programs through the development and implementation of new training program models based on features of apprenticeship." This would move our system more in the direction of the approach in West Germany.

This review does not do justice to all the positive things going on in communities across the U.S., but it does capture the major advances of the last decade, as well as the retreats. It was not, as a whole, a decade of progress in improving the prospects of our high school graduates who do not take the postsecondary route to the job market. When we ask the question "Who Links School and Work?", the answer is that at most times and in most places, it is still young people themselves, left largely to their own devices.

IN SUMMARY

Unlike other developed countries, the United States does very little to smooth the transition from school to work for high school graduates, while it spends large sums on those who continue their educations. For the non-college-bound, the road to employment is, and long has been, a bumpy one. The economic position of this half of all graduates is deteriorating; their real earnings dropped by 28 percent from 1973 to 1986, and the gap between their earnings and those of college graduates widened. With renewed interest in this school-to-work transition being expressed, the time is right for better information to inform policy and program choices for dealing with the plight of this "Forgotten Half", as they have been called by the recent report of the Commission on Work, Family and Citizenship.

As the nation deals with the transition of students who are not college bound, it must do so without resorting to a second class educational track that closes off more opportunities than it opens. And while the more particular needs of those going directly to the work world must be addressed, we must at the same time recognize the need all students have in common for a quality academic education.

While the discussion of this transition to work is almost always of how graduates get jobs, the actual transition, for the great majority of youth, has its beginning well before they leave high school. Large increases in part-time work among high school students have occurred since the early 1950's; now, more than half of juniors are working part-time, as are two out of every three seniors. While the press has reported a great deal of concern about the harm this student work may be doing to academic performance, the national studies that have been conducted do not disclose differences in average performance between those students who work and those who do not, at least until the hours of work exceed 20 per week.

While the majority of students are both going to school and working, schools are minimally — or not at all — involved in the working side of student life. Conversely, employers who hire students are almost never in contact with the schools about the educational progress and needs of the students they hire. Education and work remain two separate worlds, bridged only by the youth themselves; whatever benefit could be derived from a more planned and collaborative effort remains an opportunity unrealized. We still know little about the usefulness of this work experience in preparing students for regular jobs, although we do know that such part-time workers have lower unemployment rates after they graduate, at least in the short run.

While employers have criticized the preparation of high school graduates for the work world, the qualities and abilities they seek are often not expressed in the same terms as the formal objectives of the schooling system. To the extent these differ, the disjuncture between school success and employment success will likely remain, and educators and employers will fail to communicate.

Employers emphasize good attitudes, responsible behaviors, oral communication and listening skills, abilities to work cooperatively in teams, and problem solving skills — as well as cognitive skills. Even in the area of cognitive skills, schools and employers may be talking about somewhat different things. Recent research is showing that the reading and mathematics that are required on the job are not the same thing as those required for successful school performance. Also, good readers in school settings vary widely in their proficiency with real-life simulation tasks involving documents, as measured by the Young Adult Literacy Study conducted by Educational Testing

Service. From a third to a half of young adults fail at tasks considered only moderately complex, such as identifying information on a graph of energy sources. Such differences may account for the fact that employers often find high school graduates deficient in workplace literacy skills, even though the schools have seen fit to graduate them.

National assessments and commercial standardized tests measure achievement in terms of school objectives and curriculum, and even when they do this well, they may only partially capture the proficiencies that employers are judging the schools' products by. The Young Adult Literacy Study, however, contained simulation tasks of the kind frequently encountered in real-life settings, and the difficulty of these tasks spans the range of young adults' abilities to do them, even in a population that includes college graduates and people with advanced degrees. Further, the conceptual base for this assessment is in terms of different levels of "information processing skills," a concept that comes nearer to the "problem solving" skills employers are seeking at the workplace. What this assessment of 21 to 25 year olds found was that practically all high school graduates (who do not have postsecondary degrees) can do very simple simulation tasks involving prose, documents, and quantitative problems. However, large proportions are unable to perform what are only moderately complex tasks, such as synthesizing the main arguments from a lengthy newspaper column (33 percent) and determining from a menu the cost of a meal and calculating the correct change one should receive back (70 percent). We do not have a significant problem of "illiteracy" among high school graduates, but large proportions of these graduates are what we here call "low-level literates."

Another feature of preparation for the transition from school to work has been that in the classroom there has long been a sharp dichotomy between academic and vocational education. In fact, there has frequently been hostility between the two groups of educators and seldom any effort at a collaborative approach. However, in segments of the education community there has recently been a growing concern with improving the academic skills of vocational education students, along with a belief that the applied setting of vocational instruction can often be used to impart these traditional academic skills.

The largest effort underway to integrate academic and vocational instruction is an experiment being carried out by a consortium of 13 southern states, under the auspices of the Southern Regional Education Board. The Consortium has set specific goals for improvement in the 33 experimental schools involved, and Educational Testing Service, using exercises from the National Assessment of Educational Progress, is regularly assessing vocational education completers in these schools to track progress over time in raising academic skills. Around the country there are now a number of documented programs to bring about such an integration of these two branches of public education that have barely remained on speaking terms.

There would be widespread agreement in the employing community that improving the academic skills of vocational graduates would improve their value as entry workers. A large question is whether the use of applied settings in teaching these academic skills is a feasible and effective approach for a significant number of students. Still another is whether this combination will increase the "information processing skills" of high school graduates, of the kind measured in simulation tasks such as those used by Educational Testing Service in its Young Adult Literacy Study and to be used in the new national assessment of adults of all ages (to be fielded in 1992). In any event, such integration efforts are perhaps the most significant recent breakthrough in improving the transition from school to work.

We have asked the question "Who Links School and Work?" The answer we gave was that mostly the young people have to do it themselves, with very little help. Linking arrangements between school and work really never developed in the United States, as they have in most developed countries. Students graduate, leave school, and search for full-time jobs, largely with the poorly informed advice of their friends and relatives.

Historically the "labor market authority" in the U.S. has been the United States Employment Service. By the 1980's it had, for budgetary reasons, abandoned the start it had made 30 years earlier in bringing counseling and placement services to the schools, after having implemented programs in half the nation's schools by the early 1960's. Only vestiges remain, and national data on their existence is no longer even collected.

Counseling services in the high schools are stretched thin. As last measured at the beginning of the 1980's, almost two in five high schools had one or fewer full-time counselor equivalents; another one in five had

from one to two. Choice of courses, college admissions and selection advice, and attendance and discipline problems consumed the bulk of counselor time; just 27 percent of counselors spent 30 percent or more of their time on occupational choice and career planning, and much of that likely went to the college-bound. Just four percent spent that much time on job placement activities.

The only national initiative to help link high school students to the work world is the Jobs for Americas' Graduates program, which emerged from the effort that Governor Pierre Du Pont started in Delaware, called Jobs for Delaware's Graduates. It provides staff inside the schools that have the respect of employers, and is now operating in 16 states and 290 schools. The Boston Compact has used a variety of means of linking school and work, and the National Alliance of Business is attempting to create similar efforts in a dozen other cities. Both these efforts involve collaboration with employers. The role of employers in creating incentives to achieve may be key; John Bishop reports that few ask young job applicants what they did in school, in terms of grades and courses taken; this makes young people wonder whether achievement is that important.

As the economic position of high school graduates deteriorates, the United States may give more attention to constructing bridges from the school room to the workplace, with each side building toward the other. If interest in the half of the nation's high school graduates who do not go to college is not enough of a driving force to do so, schools and employers may be increasingly pressed together in common cause by the compelling forces of economic competition; they may find themselves in the position of Lewis Carroll's unlikely pair, the butcher and the beaver who

As the valley grew narrower and narrower still

And the night grew darker and colder

More from nervousness

If not from good will

They marched along shoulder to shoulder.

The strongest call to date on the need for employers and schools to work together is in the statement on National Goals for Education issued in February of 1990 by President Bush and the Nation's governors. For the year 2000, they set the objective that

Every major American business will be involved in strengthening the connection between education and work.

The urgency of reaching this goal is to "make us internationally competitive."

New institutional arrangements are not likely to come solely from ad hoc projects between a few businesses and a few schools, for a lot is involved. Instructional practices must be developed to create workplace skills employers demand, and students going directly into the workforce must be given the preparation they need without foreclosing opportunities for further education. Concerned leaders must also develop arrangements for interrelating experience and instruction, and provide the information about occupations and their requirements necessary to inform the choices students must make. These are appropriately public decisions, but they will need the involvement of the nation's employers.

REFERENCE NOTES

INTRODUCTION

The quotation from the *Washington Post* appeared in an editorial on 12/28/80. The William T. Grant Commission on Work, Family and Citizenship published *The Forgotten Half: Pathways to Success for America's Youth and Young Families* in November 1988. It is the first report to deal comprehensively with the situation of the non-college-bound since the 1975 publication of *The Boundless Resource: A Prospectus for An Education-Work Policy*, by Willard Wirtz and the National Manpower Institute. Youth unemployment rates and the earnings of 15 to 19 year olds are from *Youth Indicators, 1988: Trends in the Well-Being of American Youth*, Office of Educational Research and Improvement, U.S. Department of Education, August, 1988, p. 80 and p. 84.

SECTION 1. A GRADUAL TRANSITION

All the data used in this section are from *Earning and Learning: The Academic Achievement of High School Juniors With Jobs*, by Paul E. Barton, National Assessment of Educational Progress, Educational Testing Service, 1989. With regard to the role of employers in creating incentives to achieve in school, see particularly the work of John Bishop; one important report in this regard is *Productivity Consequences of What is Learned in High School*, Working Paper #88-18, Cornell University, 1988.

SECTION 2. CLASSROOM SKILLS AND WORKPLACE SKILLS

With regard to employer surveys and reports on the skills employers want entry workers to have, there is a more comprehensive review in *Workplace Competencies: Improving Literacy and Employment Readiness*, by Paul E. Barton and Irwin S. Kirsch, Office of Educational Research and Improvement, U.S. Department of Labor, 1990. The reports drawn upon here are *Investing in Our Children: Business and the Public Schools*, Committee for Economic Development, 1985; *The Fourth R, Workplace Readiness*, National Alliance of Business, 1987; and *Workplace Basics: The Skills Employers Want*, The American Society for Training and Development and the U.S. Department of Labor, 1988.

A summary of the AT&T study referred to is contained in an article by Jerry Short, titled "New and Changing Occupations," published by the National Center for Research in Vocational Education in *Occupational Adaptability: Perspective on Tomorrow's Careers*, 1979. *Experimental Studies on the Relationship of School Math and Work Math*, dated April, 1989, by Sylvia Scribner and Joy Stevens, is available from the National Center on Education and Employment at Columbia University.

Data used in this section on Document Literacy are from the Young Adult Literacy Study reported in 1986 by the National Assessment of Educational Progress at Educational Testing Service. While the data used here are from unpublished special tabulations, a full description of the study and its findings can be found in *Literacy: Profiles of America's Young Adults*, by Irwin S. Kirsch and Ann Jungeblut, and available from NAEP at Educational Testing Service.

SECTION 3. INFORMATION PROCESSING SKILLS

Information on information processing proficiencies for this section is taken from *Literacy: Profiles of America's Young Adults*, by Irwin S. Kirsch and Ann Jungeblut, National Assessment of Educational Progress, Educational Testing Service, 1986. The quotation from Thomas Sticht is from his foreword to his report. Comments are made about what employers are looking for in high school graduates; these are based on a synthesis of surveys of employers and reports of employers organizations, reported in *Workplace*

Competencies: Improving Literacy and Employment Readiness, by Paul E. Barton and Irwin S. Kirsch, published in 1990 by the Office of Educational Research and Improvement, U.S. Department of Education.

SECTION 4. INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION

Training America: Strategies for a Nation, by Anthony P. Carnevale and Janet W. Johnston, was published jointly by the National Center on Education and the Economy and the American Society for Training and Development in 1989.

The work of James E. (Gene) Bottoms on integrating academic and vocational education is described in his paper, "Closing the Gap Between Vocational and Academic Education," prepared in 1989 for the National Assessment of Vocational Education, U.S. Department of Education. The information from the 13 state Vocational Education Consortium is from "What Have We Learned?: Update on the SREB State-Vocational Education Consortium," published by the Southern Regional Education Board in 1989.

The description of five case studies is based on *The Case for Integrating Academic and Vocational Education*, by Nancy E. Adelman of Policy Studies Associates, prepared also for the National Assessment of Vocational Education.

SECTION 5. WHO LINKS SCHOOL AND WORK?

There is now almost no documentation of the involvement of the State Job Services with in-school students. For the earlier history of the cooperative program and its demise, we are indebted to Robert Schaerfl and his colleagues who administer the United States Employment Service. All that is known is contained in *The Employment Service Information Exchange Forums*, published by the U.S. Department of Labor in 1989, which surveys innovative programs. The new NCES statistical programs are described in a letter from its Acting Commissioner, Emerson Elliott, in a communication of January 19, 1990. The survey information on counseling activities in the schools is from *Survey of Career Information Systems in Secondary Schools*, by Warren Chapman and Martin R. Katz, published by Educational Testing Service in 1981. Information on the Department of Labor's current activities and plans is from a letter dated February 1990 from Carolyn U. Golding, Deputy Assistant Secretary of Labor. Quoted in this section is *Work-Based Learning: Training America's Workers*, James D. Van Erden, Employment and Training Administration, U.S. Department of Labor, November, 1989.

The description of Jobs for America's Graduates is based on an interview with its President, Kenneth Smith, who was also involved in establishing the original program in Delaware. Evaluation material and profiles of participants are found in *A Profile of Participants in Jobs For America's Graduates School-To-Work Transition Program, Class of 1989*, by Andrew M. Sum and Joanna Heliogis, Center for Labor Market Studies, Northeastern University. William Spring, Vice President of the Federal Reserve Board and a designer of The Boston Compact, provided insight into the workings of the Compact. The early efforts of the National Alliance of Business to spread the Compact are described in its 1989 report, *The Compact Project: School-Business Partnerships for Improving Education*. Another useful description is contained in *The Fourth R: Workplace Readiness* (1987), also published by the National Alliance of Business.